CLAIMS

1. A method of combining data to arrive at a composite graphical representation of a construction site comprising, the steps of:

providing subsurface mapping data;

creating a subsurface model of subsurface features from the subsurface mapping data;

creating a wire frame model of an above surface feature;

overlaying the wire frame model with a pictorial representation of the above surface feature; and

combining the wire frame model with the subsurface model to produce the composite graphical representation.

2. The method of claim 1 wherein the subsurface mapping data is resistivity data.

3. The method of claim 2 wherein the resistivity data is taken from an AGI SuperSting program.

4. The method of claim 2 further comprising the step of removing a statistical outlier from the resistivity data.

5. The method of claim 4 wherein a word processing program is used to remove the outlier.

6. The method of claim 5 wherein the word processing program is WORDPAD.

7. The method of claim 2 further comprising the step of performing a least squares data inversion analysis on the resistivity data.

8. The method of claim 7 wherein the least squares data inversion analysis is preformed by a RES3DINV program.

9. The method of claim 7 wherein the least squares data inversion analysis is performed by a RES2DINV program.

10. The method of claim 2 further comprising the step of performing a kriging analysis on the resistivity data.

11. The method of claim 10 wherein the analysis is preformed by SURFER software.

12. The method of claim 2 further comprising the step of performing a cokriging analysis on the resistivity data.

13. The method of claim 1 wherein the subsurface mapping data is ground penetrating radar data.

14. The method of claim 13 wherein the ground penetrating radar data is acquired through a SIR-3000 ground penetrating radar system.

15. The method of claim 13 wherein the data is enhanced.

16. The method of claim 15 wherein the program Radan is used to enhance the data.

17. The method of claim 1 wherein the subsurface mapping data is seismic data.

18. The method of claim 17 wherein the seismic data is acquired from a SmartSeis seismic imaging system.

19. The method of claim 17 wherein the data is enhanced.

20. The method of claim 19 wherein the program SizeImager is used to enhance the data.

21. The method of claim 1 wherein the wire frame model is created using AUTOCAD software.

22. The method of claim 1 wherein the wire frame model includes a model of vegetation.

23. The method of claim 1 wherein the wire frame model includes a model of a building.

24. The method of claim 1 wherein the pictorial representation is an aerial photograph.

25. The method of claim 24 wherein the aerial photograph is imported into EVS software.

26. The method of claim 1 wherein the subsurface model comprises at least one 2-dimensional graph.

27. The method of claim 1 wherein the subsurface model comprises at least one 3-dimensional graph.

28. The method of claim 1 wherein the composite graphical representation is produced in Visual Reduction Modeling Language.

29. The method of claim 28 wherein the graphical representation is viewed as a web page.

30. The method of claim 1 comprising the further step of displaying the composite graphical representation.

31. The method of claim 1 wherein the composite graphical representation can be rotated.

32. The method of claim 1 wherein the pictorial representation is a representation of texture.

33. The method of claim 1 including the additional step of viewing a 2-dimensional slice of the composite graphical representation.

34. The method of claim 1 wherein the graphical representation is used in a .AVI file.

35. The method of claim 1 wherein the wire frame model includes below surface ground structures.

36. A 3-dimensional model of a construction site comprising:

a graphical model of subsurface mapping data;

a spatial model of an above ground object; and

a 2-dimensional image of the above ground object superimposed on the spatial model and spatially synchronized with the graphical model of resistivity data.

37. The 3-dimensional model of claim 36 wherein the graphical model is prepared using kriging.

38. The 3-dimensional model of claim 36 wherein the spatial model is prepared using AUTOCAD.

39. The 3-dimensional model of claim 36 wherein the 3-dimensional model is rendered in Visual Reduction Modeling Language.

40. The 3-dimensional model of claim 36 wherein the subsurface mapping data is resistivity data.

41. The 3-dimensional model of claim 40 wherein the resistivity data includes data related to moisture content.

42. The 3-dimensional model of claim 40 wherein the resistivity data includes data related to a void.

43. The 3-dimenstional model of claim 40 wherein the resistivity data includes data related to a subsurface anomaly.

44. The 3-dimenstional model of claim 40 wherein the resistivity data is derived through use of the equation:

$$R = (V/I)K;$$

where K is an electrode geometric constant;

R is resistance;

V is voltage; and

I is current.

45. The 3-dimensional model of claim 36 wherein the subsurface mapping data is ground penetrating radar data.

46. The 3-dimensional model of claim 36 wherein the subsurface mapping data is seismic data.

47. A method of creating a graphical model comprising the steps of:

testing to determine subsurface mapping data;

enhancing the data;

constructing a wire frame model of an above ground structure;

providing a pictorial representation of a plan view of the above ground structure;

combining the pictorial representation with the wire frame model;

aligning the subsurface mapping data with the combined pictorial representation and wire frame model; and

merging the subsurface mapping data with the combined pictorial representation and wire frame model.

48. The method of claim 47 wherein the subsurface mapping data is resistivity data.

49. The method of claim 48 wherein the data is enhanced by performing a least squares data inversion analysis on the subsurface mapping data.

50. The method of claim 48 wherein the data is enhanced by performing a kriging analysis on the subsurface mapping data.

51. The method of claim 50 wherein the step of testing includes choosing a placement for electrodes.

52. The method of claim 50 wherein the placement is the Wenner arrangement.

53. The method of claim 51 wherein the placement is the Schlumberger arrangement.

54. The method of claim 51 wherein the placement is the dipole dipole arrangement.

55. The method of claim 47 wherein the step of combining is carried out with AUTOCAD software.

56. The method of claim 47 wherein the step of merging is carried out with EVS software.

57. The method of claim 47 wherein the step of merging results in a VRML file.

58. The method of claim 47 further comprising the step of visually displaying the merged subsurface mapping data, combined pictorial representation and wire frame model.

59. The method of claim 58 wherein the pictorial representation can be rotated.

60. The method of claim 47 wherein the step of merging results in an HTML file.

61. The method of claim 47 wherein the subsurface mapping data is ground penetrating radar data.

62. The method of claim 61 wherein the program Radan is used to enhance the data.

63. The method of claim 47 wherein the subsurface mapping data is seismic data.

64. The method of claim 61 wherein the program SizeImager is used to enhance the data.

65. The method of claim 48 wherein the wire frame model includes below ground structures.